ON SOME LAND PLANARIANS FROM BARRINGTON TOPS, N.S.W., WITH DESCRIPTIONS OF NEW SPECIES.

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(With 5 Text-figures.)

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The Land Planarians described in this paper were collected at Barrington Tops at the southern end of the Mount Royal Range, about 160 miles north of Sydney, by the Sydney University Party led by Professor Harrison in January and February, 1925.

The collection comprises six species, representing the three genera *Geoplana*, *Artioposthia* and *Platydemus*. Four species proved to be new. Types of these will be deposited in the Australian Museum.

Generic Synopsis of Australian Species.

In his "Monographie der Turbellarien. II. *Tricladida terricola*", L. von Graff has outlined a classification for all Land Planarians. As this work is not easily available, a synopsis of the families and genera known to occur in Australia is given here.

Family *Geoplanidae*.

With numerous retort-shaped eyes at the anterior end and on the sides of the body, or eyeless. Border of anterior end of body provided with little pits with sensory edges. Tentacles, suckers and headplate absent.

Genus *Geoplana* Fr. Muller (1887).

Geoplanidae with broad creeping sole. Anterior end provided with a glandular margin. Mouth and genital aperture on the ventral surface. Copulatory organs without muscular gland organs. Gland cushion absent.

Type species, *Geoplana rufiventris* Fr. Muller.

Genus *Artioposthia* von Graff (1899).

Geoplanidae with elongate body and broad creeping sole. Anterior end provided with glandular margin. Mouth and genital aperture on ventral surface. Copulatory organs provided with muscular gland organs. Gland cushion absent.

Type species, *Artioposthia fletcheri* Dendy (1891).

Family *Rhynchodemidae*.

With two eyes borne on the anterior end of the body. Tentacles, suckers and headplate absent.

Genus *Rhynchodemus* Leidy (1857).

Rhynchodemidae with a long drawn out body, oval in cross-section, with a much reduced narrow creeping sole and bearing sensory edges at the anterior end. Eyes small.

Type species, *Rhynchodemus terrestris* Fr. Muller.

Genus *Platydemus* von Graff (1896).

Rhynchodemidae with massive plano-convex body with broad creeping sole with glandular and sensory edges. Large retina eyes.

Type species, *Platydemus thwaitsei* Moseley (1875).

Family *Bipalidae*. (Extra-Australian).

Body elongate with the anterior end spread out to form a headplate. Margin of this headplate beset with small pits with sensory edges, and above with numerous eyes. Creeping sole small, beginning at the base of the headplate.

Genus *Placocephalus* von Graff (1896).

Bipalidae with headplate developed, plate with a semi-circular outline.

Type species, *Placocephalus fuscatus* Stimpson (1858).

(*Placocephalus kewensis* has been introduced into Australia.)

Family **Geoplanidae.**

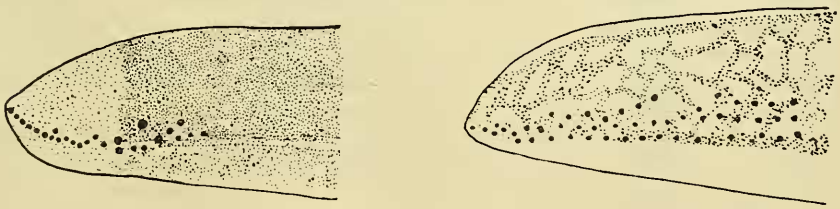
GEOPLANA CAERULEA Moseley. Text-fig. 1.

Coenoplana caerulea Moseley, *Q.J.M.S.*, xvii, N.S., 1877, p. 285.—*Geoplana caerulea* Fletcher and Hamilton, PROC. LINN. SOC. N.S.W. (2) ii, 1887, p. 361, Pl. v.

The colour of the dorsal surface varies from royal-blue to prussian-blue with a median dorsal whitish stripe not clearly defined. The ventral surface is much lighter in colour. There is an indication of a median ventral white stripe fading out behind the genital aperture. The anterior end is reddish-orange in colour. The eyes are situated at the anterior end extending into the blue portion of the body (Text-fig. 1).

The specimens collected vary in length from 3 cm. to 7 cm. (spirit specimens). In a specimen 5·2 cm. in length the mouth is 2·3 cm. and the genital aperture 2·8 cm. from the anterior end.

This was the commonest species collected, being found on rocks near the Barrington River, on damp moss, on the trunks of trees and under rotten logs. It is unlike the common *Geoplana caerulea* collected near Sydney, which has a more yellowish median dorsal stripe. This variety corresponds more closely with the type described by Moseley (1877, p. 285), "Entire body of a dark prussian blue colour, somewhat lighter on the under surface of the body with a single mesial dorsal longitudinal stripe of white. Length 5 cm., extreme breadth 4 mm. Mouth central, generative aperture 8 mm. posterior to the mouth. Parramatta, near Sydney. Under the bark of a species of Eucalyptus". There must be added to this description an observation made by von Graff (1899, p. 341). He examined



1. 2.

Text-fig. 1. Side view of anterior end of *Geoplana caerulea*.
Text-fig. 2. Side view of *Geoplana citrina*.

Moseley's type in the British Museum and points out that the anterior tip is coloured orange-yellow in that specimen. From these observations it may be concluded that *Geoplana caerulea* var. *typica* is a blue planarian with a mesial dorsal white stripe and an orange-yellow tip.

The variety described by Fletcher and Hamilton (1887, p. 362) from Hyde Park, which did not possess the coloured anterior tip, must be regarded as a variety. The common Sydney variety with a mesial dorsal yellowish stripe must be regarded as still another variety of the species.

This species has been recorded from various places in Eastern Australia and from New Zealand. All workers draw attention to the very wide variation within the species. Dendy (1891, p. 124), in discussing this species, writes: "The ground colour of the dorsal surface (in life) ranged from pale indigo-blue to dark grey, blue-brown or almost black. The mid-dorsal yellow stripe was sometimes so pale as to be almost white, and frequently there was visible on each side an ill-defined dorso-lateral band of a lighter tint of the ground colour, dividing each half of the dark dorsal surface into a broader and a narrower band. The anterior extremity was pinkish, although sometimes the pinkish colour was scarcely recognizable. The ventral surface was bright blue, lighter in the mid line than elsewhere".

Geoplana citrina, n. sp. Text-fig. 2.

The dorsal and ventral surfaces of the body are clearly marked off from one another. The ventral surface is flat and of a uniform lemon colour. The dorsal surface is very convex and has a lemon ground colour, deeply mottled with sienna. There is a median dorsal stripe of ground colour, bounded on either side by a sienna stripe, definite on the inner border but merging into the sienna mottlings of the lateral regions of the dorsal surface. In spirit specimens the lemon colour becomes whitish. The eyes are arranged in three parallel rows on either side of the body, extending from the anterior end to about the middle of the body (Text-fig. 2).

A spirit specimen measures 9 cm. The mouth is small and situated in the mid ventral line, 51 mm. from the anterior end, and the genital aperture is 12 mm. posterior to the mouth.

Habitat.—Under rotten log, *Fagus* scrub, Barrington Tops.

This species resembles *Geoplana robusta* Steel in general shape, but is larger and has the lateral regions of the body irregularly mottled.

Geoplana barringtonensis, n. sp.

The dorsal and ventral surfaces are not clearly marked off from one another. The ground colour is lemon. In the mid-dorsal line is a white stripe bordered on either side by pale sienna mottlings, which extend to the lateral regions of the body. The mottlings are so pale that they only add brightness to the lemon ground colour, making the median white stripe stand out more conspicuously.

The eyes are very numerous and are present as minute black specks placed ventro-laterally at the extreme anterior end, and extending round the horse-shoe shaped tip and along the whole length of the body to the posterior end. They are more numerous at the anterior end.

A spirit specimen measures 5·1 cm. The mouth is situated on the ventral surface 2·6 cm. from the anterior end; the genital aperture is 1·2 mm. behind the mouth.

Habitat.—On damp moss, Barrington Tops.

This species differs from *Geoplana fletcheri* Dendy in the possession of a median dorsal white stripe and in the absence of any coloration of the anterior tip.

Artioposthia harrisoni, n. sp. Text-figs. 3, 4.

The ground colour of the dorsal surface is creamish-white. There is a wide median stripe of ground colour bounded on either side by a narrower black stripe with a definite median border and an indefinite lateral border. Laterally the body

is marked by a number of small dark brown spots. The ventral surface is white. At the anterior end the black stripes of the dorsal surface widen out, become brownish in colour and cover the lateral edges of the ventral surface (Text-fig. 3).

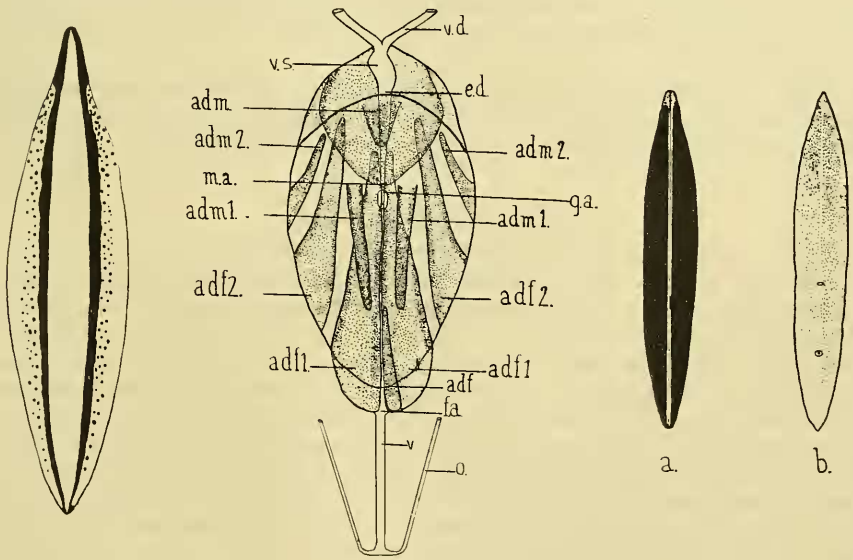
Spirit specimens measure 1·6 cm. The mouth is situated 7 mm. from the anterior end and the genital aperture is 3 mm. behind the mouth. Both apertures are extremely small.

Habitat.—On rock and on tree near Barrington River, Barrington Tops.

This species is unlike any described species of *Artioposthia*. It is very small and at first was taken for an immature specimen. Serial sections show it to be sexually mature.

In the generic synopsis (von Graff) given above, it will be noted that the genus *Artioposthia* is separated from the other genera of the family Geoplanidae because of the possession of muscular gland organs. These organs can be examined only by micro-dissection or by reconstruction of serial sections. The description given here has been worked out from a reconstruction of a series of transverse sections.

Male Organs (Text-fig. 4).—The two vasa deferentia (*v.d.*) unite just behind the pharyngeal region to form a slightly expanded vesicula seminalis (*v.s.*), which turns to the right and towards the ventral surface to open into the narrow



3. 4. 5.

Text-fig. 3. Dorsal surface of *Artioposthia harrisoni.*

Text-fig. 4. Reconstruction of genital organs in region of genital atrium of *Artioposthia harrisoni.* *adf.*, *adf1.*, *adf2.*, female adenodactyli; *adm.*, *adm1.*, *adm2.*, male adenodactyli; *f.a.*, aperture of vagina; *e.d.*, ejaculatory duct; *m.a.*, male aperture; *o.*, oviduct; *v.*, vagina; *v.d.*, vas deferens; *v.s.*, vesicula seminalis.

Text-fig. 5. *a.* Dorsal surface of *Platydemus assimilis.* *b.* Ventral surface.

glandular ejaculatory duct (*e.d.*), which passes back through the muscular penis to open into the genital atrium towards its dorsal wall (*m.a.*).

In addition to these copulatory organs there are a number of finger-like outgrowths from the wall of the genital atrium. These outgrowths are termed adenodactyli (von Graff). They vary in size and shape, but are arranged symmetrically in this species. There are five situated near the male aperture and five near the female aperture. The male adenodactyli are slender and short, the female adenodactyli are nearly all thick and long. In transverse section they show a central cavity surrounded by gland cells, which are enclosed in a muscular sheath.

The male adenodactyli are arranged around the male aperture. One arises from the ventral surface of the penis (*adm.*); it is short and thick, being not as long as the free portion of the penis. One pair arises from the dorsal surface of the genital atrium posterior to the common genital aperture (*adm1*). One pair arises from the side walls of the genital atrium (*adm2.*).

Female Organs.—The two oviducts, running from the ovaries at the anterior end of the body, swing in to the middle region of the body some distance behind the genital atrium, uniting to form the vagina (*v.*). The vagina runs forward to open into the posterior end of the genital atrium (*f.a.*).

There are five female adenodactyli. One pair arises from the side walls of the atrium just behind one pair of the male adenodactyli (*adf2.*). One pair arises from the posterior end of the genital atrium surrounding the aperture of the vagina (*adf1.*). The small unpaired one arises from the dorsal surface near the aperture of the vagina (*adf.*).

These adenodactyli fill the cavity of the genital atrium and may protrude through the genital aperture, which is situated in the ventral wall of the genital atrium just behind the aperture of the penis into the genital atrium.

Family Rhynchodemidae.

Platydemus assimilis, n. sp. Text-fig. 5.

The body is plano-convex, slightly flattened from above downwards. Dorsal and ventral surfaces are distinctly marked off from one another. The ground colour of the dorsal surface is very dark grey, almost black. There is a median dorsal black stripe, bounded on either side by a narrower light grey stripe. Laterally the dorsal surface is dark grey. At the anterior end the two light grey stripes widen out on their lateral margins, extending over the lateral regions of the anterior end. The ground colour of the ventral surface is a lighter grey. There is a median whitish stripe widening out at the mouth and genital aperture. There are two lateral whitish stripes, which are not clearly defined, separating the light grey of the ventral surface from the dark grey of the dorsal surface. The two eyes are borne on the dorsal surface, one on either side of the median black stripe, about 2 mm. from the anterior end (Text-fig. 5).

Spirit specimens measure from 2·1 cm. to 2·7 cm. In a specimen 2·1 cm. in length the mouth is situated 1·2 cm. and the genital aperture 1·7 cm. from the anterior end.

Habitat.—Under rotten log, Barrington Tops.

This species closely resembles *Platydemus victoriae* Dendy, but it has the stripes more clearly defined and is very much darker in colour.

References.

DENDY, A., 1890.—On the Victorian Land Planarians. *Trans. Roy. Soc. Vict.*, ii, pp. 65-88, Pl. vii.

————, 1891A.—Additional Observations on the Victorian Land Planarians. *Trans. Roy. Soc. Vict.*, iii, pp. 27-41, Pl. iv.

————, 1891B.—Description of some Land Planarians from Queensland. *Proc. Roy. Soc. Vict.* (1892), pp. 123-129, Pl. xi.

FLETCHER, J. J., and HAMILTON, A. G., 1887.—Notes on Australian Land Planarians with Descriptions of some new species. PROC. LINN. SOC. N.S.W., ii, pp. 349-374, Pl. x.

VON GRAFF, L., 1899.—Monographie der Turbellarien. II. *Tricladida terricola.* Text and Atlas.

MOSELEY, H. N., 1877.—Notes on the Structure of Several Forms of Land Planarians, with a Description of two new genera and several new species, and a list of all species at present known. *Q.J.M.S.*, xvii, N.S., pp. 273-292, Pl. xx.

STEEL, T., 1897.—Australian Land Planarians. Descriptions of new species and notes on Collecting and Preserving. Part i. PROC. LINN. SOC. N.S.W., xxii, pp. 104-119, Pls. vii-viii.

————, 1900.—Australian Land Planarians. Descriptions of new species and notes on Collecting and Preserving. Part ii. PROC. LINN. SOC. N.S.W., xxv, pp. 563-580.